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FOREST INSECT INVESTIGATIONS

FOREST INSECT CONDITIONS
GRAND TETON NATIONAL PARK
Season 1938

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HISTORY OF MOUNTAIN PINE BEETLE INFESTATION*

During the season of 1931 a few lightly attacked lodgepole pine trees were recorded within the timber stands at the lower end of Jenny's Lake. The source of this infestation was unknown but did not appear to be of local origin, as there were no dead trees that had been killed in 1930 by the mountain pine beetle. Although control measures were recommended for this infestation, the existence of severe outbreaks within all forest lands adjacent to the Park made the ultimate success of the project somewhat questionable. However, the scenic value of the timber stands in question justified the expenditures necessary for the treatment of this infestation in the hopes that success would be attained. The infested trees were treated in the spring of 1932, and during the subsequent years there has been very little, if any, loss from the mountain pine beetle within this area.

Severe infestation of the mountain pine beetle within the white-bark pine stands along the Glacier Trail and Death Canyon area were recorded in 1932. Although there had been a light infestation within these areas the previous season, no evidence of 1930 attacks was recorded. Control measures were instituted in the spring of 1933, in

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* Based upon data secured by the Bureau of Entomology and Plant Quarantine, and issued in unpublished reports.

the hopes of preserving the remaining trees within these scenic areas. Though durin subsequent years there have been some additional losses, the beneficial effects of these projects have been evidenced in the reduced infestation which followed.

The following year an additional area of whitebark pine infestation was recorded along the newly constructed Cascade Creek Trail, for which control measures were recommended. During the survey conducted at that time a rather severe infestation was also recorded in the lodgepole pine stands of the Windy Point area. With no infestation being recorded from this area during the previous two seasons, the 1933 survey data showed an average of .35 of an infested tree per acre. As no further efforts were then being made to control the infestation within the forests adjacent to the Park, the direction of control against this infestation appeared futile, and no action was taken. Though the source of the Windy Point infestation is questionable, the most probable explanation would be that the beetles spread from the infested whitebark pine areas lying along the higher elevations of the park.

The status of the mountain pine beetle infestation during the years 1934-1937 inclusive will be shown in the discussion of the 1938 situation within the different areas.

1938 SURVEY

The Grand Teton National Park was covered by an extensive forest insect survey during the later part of September. The survey was

conducted by the Bureau of Entomology and Plant Quarantine, under the supervision of the Forest Insect Laboratory at Coeur d'Alene, Idaho. A crew of four men under the field leadership of Carroll D. Heath was employed on this project, spending a total of four full crew days. Though the Teton Park is not a large area, it is a rather difficult one on which to conduct a forest insect survey. The timber types are broken into small bodies of timber, which with the rough terrain of the Teton Mountains make the execution of such a survey a laborious and time-consuming task.

Data concerning the seriousness of the 1938 infestations of the mountain pine beetle were obtained from sample strips one chain in width that were projected through all pine stands. Although somewhat mechanically located, all available timber type data as well as the best judgment of the officer in charge were used in plotting these strips in order that the sample secured would be representative of the area in question. Strip locations are plotted by compass bearings that are roughly followed by the strip runners, who also pace the distance covered. Data obtained from these strips are recorded for each acre (10 chains) covered, which permits the segregation of the more seriously infested areas.

1938 STATUS MOUNTAIN PINE BEETLE INFESTATION

WINDY POINT UNIT - Lodgepole Pine — 1,920 Acres

Acres of sample strip	Trees on strip: New attacks	Trees on strip: Green trees	Trees per acre of strip: New attacks	Trees per acre of strip: Green trees
126	122	8132	.968	64.54

Percent of stand killed: 1.5

Total of infested trees: 1,858

The Windy Point unit is a bench or terrace lying to the south of Park headquarters and between the Teton Mountains and the floor of Jackson Hole. This area is covered by a rather pure stand of lodgepole pine with a few spruce and alpine fir. The lodgepole varies in age from mature trees to small poles, with the infestation, which is mostly located to the east of the Pemble Trail, being confined to mature trees. This unit is accessible and open to travel by a number of wood roads which traverse the area.

The character of the infestation that has been present within this area for the past 6 years is shown in the following tabulation.

Year	Infested trees per acre	Total infested trees
1931	0.00	.00
1932	0.00	.00
1933	.35	672
1934	.45	864
1935	2.58	4,953
1936	4.58	8,793
1937	1.90	3,648
1938	.97	1,862

The above data show the rapid rise of this infestation during the years of 1933-1936 inclusive, with its decline during the past two seasons. The future of this infestation is difficult to predict; however, it would seem from the present trend that there should be a still further reduction in its severity during the coming season.

Regardless of the past season's reduction, as the 1938 attacks are normal in severity the infestation is still potentially dangerous.

Within this unit, as in all other areas of the northern Rocky Mountains, there has been a severe loss of alpine fir. The 1937-attacked trees were seen as small groups of red tops distributed along the base of the Teton Range. The tussock moth outbreak which appeared within this area during the past season did not result in any appreciable damage.

BRADLEY-TAGGART UNIT - Lodgepole Pine 1,950 Acres

	Trees on strip		Trees per acre of strip	
Acres of sample strip	New attacks	Green trees	New attacks	Green trees
115	10	5801	.086	50

Percent of stand killed: .17

Total of infested trees: 167

The Bradley-Taggart Lakes unit consists of the bench or terrace lands lying between Park Headquarters and Jenny's Lake. The timber type is primarily of lodgepole pine of varying age classes, with a mixture of alpine fir, Douglas fir, and Engelmann spruce. To the west of this unit as the elevation rises above the Bradley-Taggart moraines the timber types break rather abruptly into Douglas fir and alpine fir.

The history of the infestation within this area is shown in the following tabulation.

Year	Infested trees per acre	Total infested trees
1931	.10	200 treated
1932	.00	0
1933	.142	276
1934	.153	298
1935	.21	409
1936	No data taken	
1937	Very light infestation	
1938	.086	167

It will be seen that the infestation within this area followed the same trend as the more heavily infested Windy Point unit. There is also evidence of 1937 kill of alpine fir within this area.

JENNY'S LAKE AREA - Lodgepole Pine 200 Acres

Acres of sample strip	Trees on strip: New attacks	Trees on strip: Green trees	Trees per acre of strip: New attacks	Trees per acre of strip: Green trees
85	1	2,848	.011	33

Percent of stand killed: .035

Total of infested trees: 2

The Jenny's Lake unit lies around the lower end of Jenny's Lake. The timber stand is primarily a pure lodgepole stand of mature trees, which give way to spruce and alpine fir at slightly higher elevations. The record of the past infestation within this area is as follows:

Year	Infested trees per acre	Total infested trees
1931	.437	87 (Treated 1932)
1932	.000	0
1933	.000	0
1934	.000	0
1935	.25	50
1936	No data	
1937	.39*	78
1938	.01	2

*This figure is believed to be too high.

The preceding data show no serious infestation within this area, as the one infested lodgepole pine was in the campground and had been badly injured by tourists. One spruce windfall that had been attacked during the summer was also recorded, although no recent spruce kill was observed.

WISTER DRAW UNIT - Lodgepole Pine 1,280 Acres

Acres of sample strip	Trees on strip: New attacks	Trees on strip: Green trees	Trees per acre of strip: New attacks	Trees per acre of strip: Green trees
58	4	2,936	.069	50

Percent of stand killed: .14

Total of infested trees: 88

The Wister Draw unit is an area of lodgepole pine, with some Douglas fir and spruce, on the north side of Phelps Lake. The lodgepole pine is of different age classes, with approximately 40 percent being mature. In 1937 an infestation of .6 of a tree per acre was

recorded within this unit. As the 1938 loss was only .069 of a tree per acre, it is apparent that the severity of the infestation has decreased and that the situation is not serious.

Some losses prior to 1936 have occurred within the spruce stands, and there was one rather large group of Douglas fir (30) that was killed in 1936.

INDIAN PAINT BRUSH CANYON 1,280 Acres

Acres of sample strip	Trees on strip: New attacks	Trees on strip: Green trees	Trees per acre of strip: New attacks	Trees per acre of strip: Green trees
64	0	725	0	11.33

Although in this unit there have been some past losses of lodgepole, spruce, alpine fir, and Douglas fir, no 1938 attacks of bark beetles were recorded in any of the tree species.

GLACIER TRAIL UNIT

As previously stated, a severe whitebark pine infestation was recorded from this area in 1932. Control measures were recommended and instituted in the spring of 1933. This season's survey failed to record any 1938 attacks of this beetle, although a few scattered 1937 (red tops) attacks were observed.

DEATH CANYON UNIT

Three 1938 attacks of the mountain pine beetle in whitebark pine were recorded in this unit, with approximately twenty-five 1937 attacks. A rather severe infestation existed within this unit in 1932, that was

treated in the spring of 1933. Since that time there has been a greatly reduced but somewhat constant annual loss. Although the trees injured during trail construction undoubtedly contributed toward a greater concentration of the infestation, severe outbreaks existed in other whitebark pine areas where there has been no trail construction.

CASCADE CREEK UNIT

Although in 1933 there was a rather severe infestation of the mountain pine beetle within the whitebark pine stand of this area, only two 1938 attacks were recorded. It would seem that during the past few years this infestation has been at a rather constant endemic status.

SUMMARY OF PRESENT SITUATION

With the exception of the Windy Point unit, there are no bark beetle infestations within the Grand Teton National Park that could be considered as being at all serious. Even the Windy Point infestation had decreased from 4.58 infested trees per acre in 1936 to .97 trees per acre in 1938. Although under these circumstances one could expect a still further decrease in 1939, the infestation on this area can still be considered as being potentially dangerous. The 1938 attacks are heavy, reaching to a normal height upon the tree, which is not indicative of a reduction. However, one is rather at a loss to explain the decrease from 1.9 infested trees per acre in 1937 to the present infestation, as the heavy 1937 broods indicated a rather marked increase rather than a decrease.

The area upon which this infestation is concentrated is a valuable one to the National Park. It is close to the main highway and includes the area occupied by the Park headquarters. Furthermore a serious bark beetle epidemic within this area would unquestionably spread to other mature lodgepole pine stands of the park.

A few years ago the thoughts of control for the protection of this area were rejected because of the infestations of the mountain pine beetle which were present in all surrounding forests. Now that these outbreaks have either run their course or have been reduced in severity by other natural factors, it would seem that control might safely be instituted within this area without the results being influenced from outside areas.

RECOMMENDATIONS

Through the cooperation of the Superintendent of the Grand Teton National Park , a series of infested lodgepole pine trees on the Windy Point area were treated with a number of penetrating sprays, as a possible means of destroying the broods of the mountain pine beetle beneath the bark. This was the third year of these experiments, which were conducted primarily as a check upon the results previously secured. As the results secured from these tests were again satisfactory, it is desirable to test this method of treatment in a practical demonstration of control.

It is therefore recommended that the infested lodgepole pine trees on the Windy Point area, as well as any groups in adjacent units,

be treated during the later part of June 1938, the method of treatment to be by penetrating sprays. It is estimated that the cost of treating the infestation on the Windy Point unit (1,862 trees) would be approximately $1.35 per tree, or a total of $2,500. Of this amount approximately $1,100 would be spent for equipment and spray materials and the remainder for labor.

The institution of this project would serve the twofold objective of giving protection to a scenically valuable timber stand, as well as determining the feasibility of penetrating sprays as a practical and effective means of destroying mountain pine beetle broods in lodgepole pine. Of these two objectives the latter is perhaps of the greater importance, for though the beetle infestation is still to be considered as a potential threat to the valuable lodgepole forests of the area, it would seem that a further reduction in its severity can be expected in 1939.